QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Influence of Certain Fibres of the Cardiac Branches of the Pneumogastric in Effecting Dilatation of the Vessels and Diminishing the Frequency of the Heart.*—MM. Cyon and Ludwig believe that they have established on an experimental and sure basis the very interesting physiological fact, that one of the cardiac branches of the pneumogastric contains fibres which possess the remarkable power of effecting dilatation of the vessels, and of coincidently diminishing the frequency of the beats of the heart. They propose to call it the *depressor* nerve. A double interest is attached to this, since, if correct, it adds another instance to those already known of inhibitory nervous action, whilst it is opposed to the general proposition laid down by Marey, that the heart beats more frequently in proportion to the diminution of the resistance offered to the discharge of its contents.

The nerve in question springs, in the rabbit, either from the superior laryngeal alone, or from that nerve and the pneumogastric trunk, applies itself to the carotid artery, and runs down close by, but quite distinct from, the sympathetic nerve. It terminates by uniting with branches of the ganglion stellatum, and forming a plexus between the aorta and pulmonary arteries.

The first experiment made on this little nerve consisted in dividing it, and exciting the lower cut surface tetanically by an interrupted current. The result was *nil*. On applying the same irritation to the upper cut surface it was immediately observed that the pressure of the blood in the vessels began to diminish, ultimately reaching the half, or even one-third of the original amount, and this not only in the carotid, but also in the crural arteries—an effect that was visibly owing to a diminution in the calibre of the aorta. Coincidently with the diminution of the blood-pressure, the frequency of the beats of the heart was observed to diminish, and this occurred even when a large portion of the trunk of the pneumogastric below the point where the superior laryngeal is given off was excised. The retardation was most remarkable at the commencement of the experiment. If the experiment was prolonged whilst the pressure continued to be diminished, the frequency of the heart's action generally regained its normal standard, showing that there was no direct connection between the two. It was further shown that the depressor nerve did not act by diminishing the *force* of the cardiac beats, and thus leading to a diminution of the pressure in the vessels; since on dividing the pneumogastric, and excising the upper portion of the sympathetic in the dorsal region and the ganglion stellatum, with all its branches, irritation of the centric cut surface of the depressor nerve was still followed by diminished pressure in the vessels. And hence, as all reflex paths by which it might have acted on the heart had been removed, the only explanation that remains is that it acts by diminishing the resistances to the onward passage of the blood. MM. CYON and LUDWIG at once set to work to determine the correctness of this opinion; and, remembering the influence stated to be exerted on the vessels by the splanchnics, they instituted some experiments on these nerves. They found that section of the splanchnics, effected a marked lowering of the pressure in the vessels, whilst irritation of the peripheric cut extremity was speedily followed by exaltation of the pressure. Irritation of the centric extremity was not followed by any observed result. On thinking over these results, it struck them that the depressor nerve might act reflectorially on the vessels through the splanchnics; and the experiment suggested itself of dividing the splanchnics, when, if their view was correct, irritation of the depressor should be of no effect. Moreover, it was already known that compression of the aorta was followed by exaltation of the pressure; and it was therefore natural to expect that, if compression were made, irritation of the depressor should again be followed by very slight, if any, result. Both experiments turned out as they expected. They therefore believe they have established the fact that the small nervous twig, with the above-mentioned relations, possesses the power of reflectorially diminishing the tone of the vessels, and is to be classed as one of the most striking instances of inhibitory action, other examples of which are found in the influence of the vagus in arresting the action of the heart, of the chorda tympani on the vessels of the glandula submaxillaris, and of the nervi erigentes on the male sexual organs.—*Lancet*, Aug 1, 1868.

---

2. *Origin of Infusoria.*—Prof. BENNETT, in a lecture "On the Atmospheric Germ Theory and Origin of Infusoria," delivered before the Royal College of Surgeons, Edinburgh, on January 17, 1868, stated the conclusions to which he had been led by observations conducted by him for a number of years. He considers that the infusoria, "vegetable and animal, which we find in organic fluids during fermentation and putrefaction, originate in oleo-albuminous molecules, which are formed in the fluids, and which, floating to the surface, constitute the primordial mucous layer of Burdach, the proligerous pellicle of Pouchet. There, under the influence of certain conditions, such as temperature, light, chemical exchanges, density, and composition of the atmospheric air, and of the fluid, &c., the molecules by their coalescence produce the lower forms of vegetable and animal life." He carefully describes the movements of bacteria and vibriones; and the disputed question as to how these grow in length he has settled by actual observation. On two occasions he saw two isolated bacteria unite together lengthways, so as to form a single moving filament. He points out that the so-called germs, collected by Pasteur from the air by means of gun-cotton, are wholly unlike the great majority of the particles we see in the proligerous pellicle. Moreover, these so-called germs, when they can be detected, are exceedingly few in number, whereas any fragment of the proligerous pellicle is crowded with incalculable numbers of molecules, for which, he contends, Pasteur's germs are wholly inadequate to account. The notion that the molecules of the pellicle multiply by division he considers opposed to the fact that they always appear before the vibriones, and evidently unite to produce these: further, he says, "if the primary molecules on the surface of an infusion possess the property of dividing, they cannot at the same moment possess the property of elongating and forming filaments. The one function is subversive of the other. While, then, a cell or vibrio may possess the property of growth and division, these two functions must be exercised at different periods of time, so that, in reference to the early stage of formation, if the molecules divide, bacteria and vibrios could not be formed. A mass of vibrionic molecules is not a compound organism; it is a mere aggregation of similar simple elements. Each of these in passing through certain phases of development may be arrested, or reach maturity at various periods, so that we frequently see different forms present at one time; but that the same forms and the same stages of growth should exhibit directly opposite functions, is surely not in accordance with physiological knowledge." Therefore his conclusion is that the vibriones and other filaments are evidently formed from the molecules, and not the molecules from the filaments. He has also performed numerous experiments, with a view to determine whether or not it be possible to prevent the development of infusoria in a

fluid by means calculated to destroy germs. These experiments were similar to those performed by Schutze, Schroeder, and Dusch, and others, with this difference, that he in every case used nearly all the agents which have been proposed to destroy germs. These experiments have convinced him, that although means be used sufficient to destroy germs in an infusion and in the air in contact with it, infusoria are developed notwithstanding. In conclusion, he points out that these facts and arguments are hostile to the doctrines "omne vivum ex ovo," "omne cellula e cellula," and lastly directs attention to many circumstances which show that organic forms are first produced, and vital properties are afterwards added to them.—*Edinb. Med. Journ.*, March, 1868.

MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

3. *Bromide and Bi-bromide of Mercury as Therapeutical Agents.*—Dr. Protheroe Smith, in a paper read at the *Brit. Med. Assoc.*, states that he has used the bromide and bi-bromide of mercury for upwards of five years, and had found the bromide valuable as an efficient cholagogue and purgative, promoting absorption of morbid tissue with less constitutional disturbance than from calomel. He cited instances, and called on members of the Association to aid him by their efforts further to investigate the subject and to prove his conclusions.—*Brit. Med. Journ.*, Aug. 8, 1868.

4. *On the Anæsthetics of the Present Day.*—Dr. A. Ernest Sansom, in a paper read before the *Brit. Med. Assoc.*, reviewed the anæsthetics now employed with reference to their special advantages in special cases and circumstances. The employment of nitrogen proved that anæsthesia could be induced by the mere deprivation of oxygen. It induced the accumulation of carbonic acid in the blood, so that its administration was really equivalent to the administration of carbonic acid. Nitrous oxide had shown special advantages in cases of dentistry. The author considered that it acted chiefly by filling the lungs with a gas which could not sustain the normal processes of aeration, but he thought that it also had a special action on the blood. He considered that great care should be used in its employment, and it should not be given to any patients suffering from pulmonary, cardiac, or cerebral affections; it should certainly not be employed for any prolonged operation, but to the dental surgeon it was a great boon, inducing a rapid anæsthesia and being followed by an immediate recovery. It should only be trusted in skilled hands, and should then be used with caution. Inasmuch as both these agents induce their effects by the superinduction of an excess of carbonic acid in the blood, he recommended a renewed trial of this anæsthetic, which had been formerly employed with advantage. Briefly alluding to tetrachloride of carbon and bichloride of methylene, the author next turned to chloroform, the great danger of which was the large and unnecessary proportions which were administered. By a very large number of calculations, the author proved that by the common means adopted, atmospheres of from three to ten times the necessary strength were employed. He determined that the best diluent for chloroform is absolute alcohol; and if practitioners would use a mixture of equal parts of chloroform and alcohol, danger would be reduced to a minimum.—*Brit. Med. Journ.*, Aug. 8, 1868.

5. *Anæsthesia and the Mode of Action of Anæsthetics.*—Dr. Sansom considers that it is particularly important now that much attention be directed to practical anæsthesia, to determine the *rationale* of action of anæsthetics. He criticized the theory of their direct action on the central ganglia of sensation, which he considered disproved by many facts. On the contrary, they presented in their action a complete similarity with the phenomena of deprivation of oxygen. Tracing the action of a typical anæsthetic, the author showed that it